Space Weather Forecast

Issued on Saturday 29 March 2025 at 13:10 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Increased chance of Minor/Moderate (R1/R2) radio blackouts. Decreasing chance of Minor Geomagnetic Storm G1.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Activity rose to High in the period, with a peak Strong class flare observed at 28/1520 UTC from the vicinity of an active region in the far northeast and the neighbouring eastern solar horizon. This was followed by further Moderate class flares from the vicinity of an emerging southeastern solar horizon sunspot region.

There are up to six regions on the facing side. Changes in visible active regions have been limited in the period, with a slow spreading tendency visible in an active region in the northeast. The main activity came from the vicinity of the apparently relatively magnetically straightforward far northeastern region, however there appears to be at least some magnetic connection further east to possibly unseen regions on or over the eastern solar horizon. There is a new region appearing on the southeastern limb, and given recent flare activity from this region it is probable to be more magnetically complex than can be currently observed.

No Earth-directed Coronal Mass Ejections (CME) were observed during this period.

Solar Wind / Geomagnetic Activity: Solar wind parameters showed a gradual waning of a fast wind emanating from an intense 'coronal hole'.

The solar wind speed fell from strong levels to become elevated by the period's end. The number of particles in the solar wind was level and at background. The associated magnetic field was also at background levels with the north-south component variable and small-scale. The net result of the above solar wind measures was for Quiet to Active (Kp1-4) geomagnetic activity.

Energetic Particles / Solar Radiation: No solar radiation storms were observed, however a possible very slight enhancement was seen in the wake of the Strong-class flare in 10MeV protons - still remaining below 1pfu even at peak, (where '10pfu' is Minor Solar Radiation Storm S1).

Four-Day Space Weather Forecast Summary

Solar Activity: The chances of both Moderate and Strong-class X-ray activity have been revised upwards slightly relative to recent guidance, with the probable arrival of up to two large eastern

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solar horizon regions. Moderate-class flares are now rated at a flat chance throughout, with a slight chance of X-class. No significant regions depart the facing side to reduce these levels.

Solar Wind / Geomagnetic Activity: No CMEs feature in the four-day forecast. The current fast wind carries an ongoing chance of giving isolated G1 Minor Geomagnetic Storm intervals at first, otherwise geomagnetic activity is expected to be generally Quiet to Unsettled with isolated Active intervals into the new UTC working week. There is then a possible minor resurgence due on 01 April from a comparatively minor coronal hole, with a further slight chance of G1.

Energetic Particles / Solar Radiation: No solar radiation storms are expected, with a negligible chance of enhancement from any larger flares given their likely far eastward emission locations.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	No	20	10	1	5
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	50	50	50	50
Very Active	R3-R5 (X Class)	Yes	15	15	15	15

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	1	2	2	5
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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